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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
STEVENS, THOMAS H	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 09/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/623,444	SHAHOUMIAN ET AL.	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-33 were examined.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 204A..204J. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 7 and 29 are objected to because of the following informalities: the office suggest change the article in the limitation of " the center of gravity" to "a center of gravity" avoid a possible antecedent problem.

Claim Interpretation

4. Office personnel are to give claims their **"broadest reasonable interpretation"** in light of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited

in the claim are not read into the claim. *In re Prater,* 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551(CCPA 1969). See *also *In re Zletz,* 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow") .... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed .... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process. The Officer interprets the invention's intricate details of height/weight and gravity equal to the Cook references disclosure (Cook: column 8, lines 10-15 and 20-45).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-13, 16-19, 23–30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook et al., (US Patent 5,850, 539; hereafter Cook) in view of Koolen et al., titled "A Low-Cost, High-Density Mounting System for Computer Clusters".

Cook teaches an automated system for facilitating the creation of a rack-mountable component (title) such as height (Cook: column 7, line 48); but fails to teach design constraints.

Koolen teaches a low-cost, high-density system for computers (title) with design constraints (Kolen: pg.157, section 2 “Design Constraints”).

Both Cook and Koolen are analogous art since they both teach computer rack design implementation.

Therefore it would have been obvious to one having ordinary skill in the art at the time of invention was made to utilize the increase cluster computing system increases of Koolen in the CAD-based computer rack design of Cook because Koolen teaches a method that provides easy access to network cables and can be utilized to rapidly change the network topology for experimentation (Koolen: pg. 162, lines 3-6).

Claim 1. A method of determining placement of components (Cook: column 8, lines 39-41) in a rack comprising the steps of: providing a rack height (Cook: column 7, line 48), a set of components (Cook: column 8, lines 39-41), and a height for each component in the set of components (Cook: column 8, lines 39-41); determining a placement of the components (Cook: column 8, lines 39-41) in the rack according to constraints (Kolen: pg.157, section 2 "Design Constraints"); and evaluating the placement of the components (Cook: column 8, lines 39-41) according to an objective.

Claim 2. The method of claim 1 wherein the constraints (Kolen: pg.157, section 2 "Design Constraints") comprise: a rack height (Cook: column 7, line 48) constraint which requires that placement of a particular component does not result in a top height of the particular component exceeding the rack height; a single placement constraint (Kolen: pg.157, section 2 "Design Constraints") which requires that each component be placed once and only once; and a non-overlapping constraint which requires that each slot in the rack be occupied by no more than a single component.

Claim 3. The method of claim 2 wherein the constraints (Kolen: pg.157, section 2 "Design Constraints") further comprise a height preference constraint (Kolen: pg.157, section 2 "Design Constraints") which prefers that a first component be placed above a second component (see claim interpretation).

Claim 4. The method of claim 1 wherein the step of determining placement of the components (Cook: column 8, lines 39-41) according to the constraints (Kolen: pg.157, section 2 "Design Constraints") finds that at least one of the constraints (Kolen: pg.157, section 2 "Design Constraints") cannot be met and further comprising the steps of: relaxing a particular constraint; and determining placement of the components (Cook: column 8, lines 39-41) according to remaining constraints (Kolen: pg.157, section 2 "Design Constraints").

Claim 5. The method of claim 4 wherein the step of relaxing the particular constraint comprises providing a choice of relaxation constraints (Kolen: pg.157, section 2 "Design Constraints") to a user and the user selecting the particular constraint from the choice of relaxation constraints (Kolen: pg.157, section 2 "Design Constraints").

Claim 6. The method of claim 1 further comprising the step of providing a weight and a weight distribution (see claim interpretation) for each component in the set of components (Cook: column 8, lines 39-41).

Claim 7. The method of claim 6 wherein the step of evaluating the placement of the components (Cook: column 8, lines 39-41) in the rack according to the objective comprises seeking a minimum height for the center of gravity.

Claim 8. The method of claim 6 wherein the step of evaluating the placement of the components (Cook: column 8, lines 39-41) in the rack according to the objective comprises ensuring that a height of the center of gravity (see claim interpretation) does not exceed a selected height.

Claim 9. The method of claim 1 further comprising the step of providing a placement height range for a particular component, (see claim interpretation) wherein the placement height range comprises a minimum height and a maximum height (see claim interpretation).

Claim 10. The method of claim 9 wherein the placement height range is increased, thereby forming an increase in the placement height range, (see claim interpretation) and further wherein a penalty is applied to the objective according to the increase in the placement height range (see claim interpretation).

Claim 11. The method of claim 1 further comprising the step of providing an empty space requirement for a particular component (Cook: column 8, lines 33-35).

Claim 12. The method of claim 11 wherein the empty space requirement is selected from the group consisting of an empty space requirement (Cook: column 8, lines 33-35) above the particular component (Kolen: pg.157, section 2 "Design Constraints") and an empty space component below the particular component (Kolen: pg.157, section 2 "Design Constraints").

Claim 13. The method of claim 11 wherein the empty space requirement (Cook: column 8, lines 33-35) is relaxed, thereby forming a relaxation of the empty space requirement, and further wherein a penalty is applied to the objective according to the relaxation of the empty space requirement (Cook: column 8, lines 33-35).

Claim 16. The method of claim 1 further comprising a contiguous placement constraint for at least two of the components (Cook: column 8, lines 39-41) within the set of components (Cook: column 8, lines 39-41).

Claim 17. The method of claim 16 wherein the step of determining the placement of the components (Cook: column 8, lines 39-41) in the rack according to the constraints (Kolen: pg.157, section 2 "Design Constraints") comprises forming a virtual component from the at least two components (Cook: column 8, lines 39-41) according to the contiguous placement constraint and further wherein remaining constraints (Kolen:

pg.157, section 2 "Design Constraints") determine placement of the virtual component.

Claim 18. The method of claim 1 further comprising the step of evaluating the placement of the components (Cook: column 8, lines 39-41) according to a second objective.

Claim 19. The method of claim 1 further comprising the step of evaluating the placement of the components (Cook: column 8, lines 39-41) according to additional objectives.

Claim 23. A method of determining placement of components (Cook: column 8, lines 39-41) in a rack comprising the steps of: providing a rack height, a set of components (Cook: column 8, lines 39-41), and, for each component in the set of components (Cook: column 8, lines 39-41), a height, a weight, and a weight distribution; determining a placement of the components (Cook: column 8, lines 39-41) in the rack according to constraints (Kolen: pg.157, section 2 "Design Constraints"), wherein the constraints (Kolen: pg.157, section 2 "Design Constraints") comprise: a rack height (Cook: column 7, line 48) constraint which requires that placement of a particular component does not result in a top height of the particular component exceeding the rack height (see claim interpretation); a single placement constraint (Kolen: pg.157, section 2 "Design Constraints") which requires that each component be placed once and only once; and a non-overlapping constraint (Kolen: pg.157, section 2 "Design Constraints") which

requires that each slot in the rack be occupied by no more than a single component; and evaluating the placement of the components (Cook: column 8, lines 39-41) by seeking a minimum height for a center of gravity of the components (Cook: column 8, lines 39-41).

Claim 24. A computer readable memory comprising computer code for directing a computer to make a determination of placement of components (Cook: column 8, lines 39-41) in a rack, the determination of the placement of the components (Cook: column 8, lines 39-41) comprising the steps of: obtaining a rack height, a set of components (Cook: column 8, lines 39-41), and a height for each component in the set of components (Cook: column 8, lines 39-41); determining a placement of the components (Cook: column 8, lines 39-41) in the rack according to constraints (Kolen: pg.157, section 2 "Design Constraints"); and evaluating the placement of the components (Cook: column 8, lines 39-41) according to an objective.

Claim 25. The computer readable memory of claim 24 wherein the constraints (Kolen: pg.157, section 2 "Design Constraints") comprise: a rack height (Cook: column 7, line 48) constraint which requires that placement of a particular component does not result in a top height of the particular component exceeding the rack height (see claim interpretation); a single placement constraint which requires that each component be placed once and only once (see claim interpretation); and a non-overlapping constraint which requires that each slot in the rack be occupied by no more than a single

component (see claim interpretation).

Claim 26. The computer readable memory of claim 24 wherein the step of determining placement of the components (Cook: column 8, lines 39-41) according to the constraints (Kolen: pg.157, section 2 "Design Constraints") finds that at least one of the constraints (Kolen: pg.157, section 2 "Design Constraints") cannot be met and further comprising the steps of: relaxing a particular constraint; and determining placement of the components (Cook: column 8, lines 39-41) according to remaining constraints (Kolen: pg.157, section 2 "Design Constraints").

Claim 27. The computer readable memory of claim 26 wherein the step of relaxing the particular constraint comprises providing a choice of relaxation constraints (Kolen: pg.157, section 2 "Design Constraints") to a user and the user selecting the particular constraint from the choice of relaxation constraints (Kolen: pg.157, section 2 "Design Constraints").

Claim 28. The computer readable memory of claim 24 further comprising the step of obtaining a weight and a weight distribution (see claim interpretation) for each component in the set of components (Cook: column 8, lines 39-41).

Claim 29. The computer readable memory of claim 28 wherein the step of evaluating the placement of the components (Cook: column 8, lines 39-41) in the rack according to the objective comprises seeking a minimum height for the center of gravity (see claim

interpretation).

Claim 30. The computer readable memory of claim 28 wherein the step of evaluating the placement of the components (Cook: column 8, lines 39-41) in the rack according to the objective comprises ensuring that a height of the center of gravity does not exceed a selected height (see claim interpretation).

Claim 33. A computer readable memory comprising computer code for directing a computer to make a determination of placement of components (Cook: column 8, lines 39-41) in a rack, the determination of the placement of the components (Cook: column 8, lines 39-41) comprising the steps of: obtaining a rack height, a set of components (Cook: column 8, lines 39-41), and, for each component in the set of components (Cook: column 8, lines 39-41), a height, a weight, and a weight distribution; determining a placement of the components (Cook: column 8, lines 39-41) in the rack according to constraints (Kolen: pg.157, section 2 "Design Constraints"), wherein the constraints (Kolen: pg.157, section 2 "Design Constraints") comprise: a rack height (Cook: column 7, line 48) constraint which requires that placement of a particular component does not result in a top height of the particular component exceeding the rack height (Cook: column 7, line 48); a single placement constraint which requires that each component be placed once and only once; and a non-overlapping constraint which requires that each slot in the rack be occupied by no more than a single component; and evaluating

the placement of the components (Cook: column 8, lines 39-41) by seeking a minimum height for a center of gravity of the components (Cook: column 8, lines 39-41).

9. Clams 14, 15, 20-22, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook as modified by Koolen as applied to claims 1 and 24 above, and in further view of Waldon et al., (US Patent 6,086,617; hereafter Waldon).

Cook as modified by Koolen teaches a CAD-based rack mountable design program as recited in claims 1 and 24 for the reasons above; but fails to teach mixed integer as well as hard and soft constraints.

Waldon teaches a user directed heuristic design optimization program (title), with hard/soft constraints (Waldon: column 5, line 21) and mixed integer programming techniques (Waldon: front page, right column, Cheung et al. reference).

Cook, Koolen and Waldon are analogous art since they all teach design implementation.

Therefore it would have been obvious to one having ordinary skill in the art at the time of invention was made to utilize the optimization simulation of Waldon in the CAD-based rack mountable design program of Cook as modified by Koolen because Waldon provides a human design with tremendous control and flexibility over an optimization search (Waldon: column 5, lines 10-12).

Claim 14. The method of claim 1 wherein the steps of determining and evaluating the placement of the components (Cook: column 8, lines 39-41) comprise the step of

employing a mixed integer programming technique (Waldon: front page, right column, Cheung et al. reference).

Claim 15. The method of claim 14 wherein the step of employing the mixed integer (Waldon: front page, right column, Cheung et al. reference) programming technique employs a heuristic approach (Waldon: title).

Claim 20. The method of claim 1 wherein the constraints (Kolen: pg.157, section 2 "Design Constraints") comprise hard constraints (Waldon: column 5, line 21).

Claim 21. The method of claim 1 wherein the objective comprises a soft constraint (Waldon: column 5, line 21).

Claim 22. The method of claim 1 wherein the objective comprises a sum of soft constraints (Kolen: pg.157, section 2 "Design Constraints").

Claim 31. The computer readable memory of claim 24 wherein the step of evaluating the placement of the components (Cook: column 8, lines 39-41) comprises the step of employing a mixed integer programming technique (Waldon: front page, right column, Cheung et al. reference) .

Claim 32. The computer readable memory of claim 31 wherein the step of employing the mixed integer programming technique employs a heuristic approach (Waldon: title).

Citation to Relevant Prior Art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US Patent 5,383,562 teaches an open frame rack assembly.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715, Monday-Friday (8:00 am- 4:30 pm EST).

If attempts to reach the examiner by telephone are unsuccessful, please contact examiner's supervisor Mr. Paul Rodriguez 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.. Answers to questions regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) (toll-free (866-217-9197)).

August 27, 2006

TS

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9/5/06